





# **Annexure 1**

## **A REVIEW OF THE NATIONAL CENTER FOR BIOLOGICAL SCIENCES-WILDLIFE CONSERVATION SOCIETY M.Sc. DEGREE IN WILDLIFE BIOLOGY AND CONSERVATION**

### **Review Committee**

Paul R. Krausman, University of Montana, Missoula  
Barry R. Noon, Colorado State University, Fort Collins, Colorado  
Mewa Singh, University of Mysore, Mysore, India

### **INTRODUCTION**

Since 2004, three cohorts of students have completed the National Center for Biological Sciences (NCBS)-Wildlife Conservation Society (WCS) Master's course (M.Sc.) in Wildlife Biology and Conservation. In fall 2012, the steering committee for the course (Drs. K. Ullas Karanth, Krithi Karanth, K. S. Krishnan, Anindya Sinha, Ajith Kumar) and the NCBS administration (Drs. K. Vijay Raghavan, Director; Satyajit Mayor, Apurva Sarin, and Mathew K. Mathew) initiated an outside review to determine the strengths and weaknesses of the program, to solicit recommendations for improvement, and to determine if there was an opportunity for a conceptual change in the direction of the program. With many challenges to the persistence of wildlife in India, the M.Sc. program is essential because it educates the next generation of wildlife biologists who will implement conservation practices in the country. As stated succinctly by one faculty member we interviewed, "India is gravely in need of quality research in the ecological sciences but the community of ecologists and conservation biologists is still very small."

The review committee visited the NCBS-WCS program in Bengaluru from 5 to 12 November and was provided with a preliminary internal review by the steering committee including short biographies of the core NCBS faculty, core WCS/CWS faculty, and guest faculty; a listing and description of the course work for 2012-2014; publications resulting from student's theses, a list of student publications since 2004, and the 5 to 7 January 2010 review of the NCBS. We met with the steering committee, individually with faculty (Drs. Krithi Karanth, Kartik Shanker, Uma Ramakrishnan, Anindya Sinha, Jagdish Krishnaswamy, Geoff Hyde, Ravi Chellam, K. Ullas Karanth), and current and former students. We visited the facilities at NCBS and WSC, and visited Bandipur Tiger Reserve with Arjun Srivathsa, a graduate of the program from 2010-2012. Information acquired from our formal interviews, informal conversations in social settings outside formal interviews with students, faculty, and others with knowledge of the program (including Drs. A. J. T. Johnsingh and George Schaller), and our own personal knowledge of graduate education in wildlife conservation, which consists of >100 combined professor years that graduated >200 MSc and Ph.D. students, form the basis of our report. Further,



each member of the review team has been involved in wildlife conservation and management in India and has taught at the Wildlife Institute of India (Krausman and Noon), NCBS (Noon), and at other Indian Universities (Singh). In addition, all members of the review team have advised Indian graduate students in India and in the U. S.

Our report consists of an overview of the program, a list of program strengths, areas of the program in need of improvement, our response to the 11 challenges identified in the internal review, and a list of our recommendations to advance the program.

## **OVERVIEW**

The wildlife M.Sc. is a recent program that began in 2004 and has produced 3 cohorts of 15 students per year. The program is concentrated within a 2 year timeframe with an additional 3 months for students to prepare their thesis work for publication. A unique characteristic of the program is that it selects students with diverse academic backgrounds, that is, not all entering students have a strong foundation in the biological sciences. Despite this challenge, the program has been successful as demonstrated by a substantial publication record of the students' work and placement of students within the Indian conservation community. In addition, the quality of the program was emphasized in the 2010 review of the NCBS. Throughout our interviews and deliberations, the students and faculty generally spoke in a unified voice on most topics. There were, however, issues of concern, and areas identified where the quality of the M.Sc. program could be improved.

## **BENEFITS OF THE PROGRAM**

Based on multiple metrics such as the graduation rate of the students, gaining entry into graduate school, publishing their work, and obtaining jobs within the conservation community, the program to date can be considered successful. Some of the successes of the program may well be related to the diversity in educational backgrounds accompanied by a common interest in conservation. In the current cohort (2012-2014), students have degrees (e.g., B.Sc., B.A., B.Com., B.E., M.B.A.) in biology, biotechnology, botany, business, chemistry, environmental science, forestry, mechanical engineering, and zoology. Broad-based perspectives on conservation strategies are essential to achieve conservation goals in contemporary society. In addition to the diversity of academic backgrounds of the students, the program is housed in the academic and intellectually rich environment of the NCBS, a research institution which has an international reputation for scholarship. The joint association with NCBS and WCS provides a national and international platform to advance the goals of the program.

The housing accommodations, meals, scholarships, and research stipends are adequate to attract high quality applicants to the program and are well received by the students. We did not see the students' housing accommodations but the students spoke very highly of them. We found the meals to be well balanced,



flavorful, and abundant. There were no complaints about the scholarship stipend (10,000Rs/month) or support for their research activities.

The program has generated excitement among conservationists in India and internationally. To date, the program benefits from the formal instruction of nine guest faculty in addition to seven NCBS, and six WCS/CWS core faculty. In addition, faculties from other countries, like Dr. Noon from the U.S., have taught in the program. The time they allocate to the program is in addition to their regular job assignments, which speaks highly of their dedication to the students and the program.

Finally, the program has prepared successful graduates for additional education and employment opportunities in conservation. We met with about 19 of the 45 graduates from the first three cohorts and all were employed or in Ph.D. programs. In addition, all the graduates interviewed were unanimous in attributing much of their success to the training they received from the NCBS-WCS M.Sc. course in wildlife biology and conservation. Despite these successes, we have identified areas where the program could be strengthened.

### **AREAS FOR IMPROVEMENT**

Even though it is well known to applicants that the program involves conservation and wildlife biology, the diversity of students' backgrounds makes it essential that the program have a very clear identity for the expertise and competency expected of its graduates. Specifically, the program needs to more clearly articulate its mission. We obtained a general sense that the program focus was on "*using science to conserve wildlife in India*" but students and faculty did not have a consistent view of the mission of the program. We heard diverse opinions of the goals of the program. For example, should the training and independent research include all wildlife, be restricted to just vertebrates, further restricted to just large vertebrates, consider only terrestrial wildlife, consider only terrestrial vertebrates in danger of extinction, focus primarily on 'protected areas' or also conduct research in human-modified landscapes, or should the program have some other focus? Based on our many interviews, we conclude that there is not a clear sense of the overall mission of the program.

The lack of a clearly articulated mission is clearly related to our next concern—the lack of a minimal foundation in basic skills in biology, ecology, and mathematics in the students admitted to the program. One of the most difficult tasks a professor faces in the classroom is a pronounced variability in students' academic backgrounds. In the U.S, for example, this problem is minimized by having firm and enforced requirements for previous course work with demonstrated accomplishment in those courses before moving on to more advanced courses. In the context of the WSC/NCBS M.Sc. program this means that a minimal set of qualifications in key subject-matter areas must be met prior to consideration for a student's admission to the program of study. To do otherwise commits two errors. First, is the disservice to those students lacking the skills necessary to be successful. By admitting these students, they receive an implicit message that they have the skills necessary to be successful. Second, is the disservice to those students who are adequately prepared. By spending time on remedial instruction in a time-



constrained curriculum, these students are "held back" from fully advancing their skills and abilities.

A third area of concern is the lack of a dedicated workspace for students. Currently, students do not have a permanent place on campus where they could leave their books, computers, and papers, and study without disruption. They are generally able to use the dedicated classroom for office space but are often forced to move when others need the space for teaching or seminars. This is disruptive and does not provide the students with a sense of belonging and ownership.

A fourth area of concern is with the academic curriculum. There was general dissatisfaction with the coursework with respect to the length of some classes, shallowness of others, and absence of classes in some key topic areas. Complaining about classwork is common for students regardless of their program of study, but some issues sounded legitimate to us and deserve attention. For example, quantitative classes should be offered in a logical sequence (i.e., basic math, statistics, and advanced statistics) and students need sufficient time to consider the material and think about it so it is understandable. Short-term, intense classes may not be appropriate for some topics that require more time to fully understand novel and complex concepts. Based on student comments, some classes are out-dated and lack relevant content. We could not rigorously evaluate these concerns because some of the class descriptions were limited and other class evaluations were inconsistent among students. In general, students want more exposure to class work in the dimensions of biodiversity conservation, the biopolitical environment in which conservation plays out, climate change effects, conservation ethics, and human dimensions of conservation practice. Other classes that several students believed to be limited in scope include classes in botany, community ecology, biophysical drivers, habitat, and management. Students also expressed a desire for more time with classes in quantitative methods and evolution. We temper our reaction to these "complaints" by our recognition that a desire for more classes but no more time commitment is a frequent, unrealistic request by students of all nationalities. In this program, the time for classwork is extremely limited and adding more classes would require eliminating some courses or revising others to accommodate those deemed most important. Another option would be to expand the length of the program to accommodate additional classes.

A key concern, consistently voiced by students, is the lack of access to faculty outside of the classroom. Because there are few faculty members from NCBS with a mandatory time allocation to the program, the program relies heavily on volunteer effort and the good will and dedication of the faculty currently engaged with the program. In addition, because guest faculties are not resident at NCBS, they are not always available when needed by some students. Faculty availability is especially important when students are working on study design, data collection and analysis. Most students expressed a desire to have more access to their faculty guide to better understand, for example, how their study design and data structure affects the scope of ecological inference that can be drawn from their research project. Given the universal nature of student requests for more time from their mentors, we, again, temper our response to this concern. However, based on reasons discussed



above, we do believe that additional access to their mentors is a legitimate request from the students.

Another concern related to the process to recruit a highly qualified replacement for the program director. Dr. Ajith Kumar received universal high praise from students and faculty independent of any questions we asked. His unique combination of academic, social, administrative, and collaborative skills are considered instrumental to the success of the program. Dr. Kumar, however, does not want to continue in the position for more than 2 to 3 years and a replacement will be needed. There is concern amongst many of the people we interviewed that it will be difficult to recruit someone with Dr. Kumar's unique skill set. Similar concerns were also expressed for maintaining the essential contributions from guest and volunteer faculty that are not permanently tied to the program.

The practice of wildlife conservation and management is both an art and a science. The discipline is complex and multi-dimensional because it involves animals, the habitats they depend on, multiple drivers of environmental change, and an understanding of how human behavior and values shape conservation practice. Thus, the profession is inherently applied and most of the premier journals that publish conservation research focus on applied and not basic research. In contrast, most scientists at the NCBS are involved in basic research and publish in generally higher impact journals than the premier journals in conservation and wildlife biology. Conservation science may operate in a fundamentally different context than much of the research conducted at NCBS. Our concern is that the inherently applied nature of conservation and wildlife biology may be viewed as "lesser science" in the eyes of some scientists. To avoid this perception requires the M.Sc. program to be particularly clear in articulating its educational objectives and goals for training future conservation practitioners. For example, field studies are the hallmark of the discipline of wildlife ecology. Such studies often require years of effort for adequate data to be collected. One result is that the number of publications may necessarily be fewer than that for scientists involved in lab or theoretical science.

Despite the constraints of field-based research, there are unexplored opportunities for the program to take better advantage of the expertise that resides at NCBS. For example, there are many aspects of conservation biology enhanced by the methods and theories of basic science including conservation genetics, forensic science, mathematical modeling, nutrition, and physiology. Because the M.Sc. program is housed in NCBS, students and faculty should take full advantage of the resources available and seek out fruitful collaborations whenever possible.

Two additional and related concerns arose from our interviews. First, if the program is to be representative of the entire country, then a broader geographic representation of students is necessary. Most students that attend the program are from central or south India. Associated with this issue is that many of the students that come from different areas of India have difficulty in adjusting to the academic culture of NCBS. Being exposed to high quality scientists and their academic culture and norms may result in "culture shock" especially for students that are new to this type of environment. We are not aware of any services currently available to students that can assist them in making the transition to academic life.



## CHALLENGES AND RECOMMENDATIONS

Many of the 11 future challenges identified by the steering committee in its internal review have already been addressed in their review. However, we will elaborate on some of the points raised in the internal review, summarize the challenges identified, and provide recommendations.

**Challenge 1.** The course attracts students with diverse backgrounds and many do not have a fundamental knowledge of biology and statistics, for example, which compromises their ability to master more advanced topics in a short period of time.

**Recommendation:** Conservation is not a luxury; it is necessary for ecosystem integrity and long-term human welfare. The WCS/NCBS program is one of only two major wildlife conservation biology programs in India (the other is the Wildlife Institute of India in Dehra Dun) and its goal should be to attract capable and highly motivated applicants. Passion for environmental resources is important but it is not a substitute for adequate academic preparation. We recommend that students accepted into the program arrive with a minimum amount of education in basic mathematics and statistics and a strong foundation in biology. These skills are the cornerstones for solid graduate education in ecology and it is difficult to acquire more advanced skills in a short period of time without a solid foundation. We recognize that a defining aspect of the program is the diversity in students' backgrounds, and we encourage maintaining the diversity in the program. However, if the selection committee identifies students that do not have a strong foundation in basic biology and quantitative skills, the program should consider ways to ensure that the requirements are met prior to formal entrance. Perhaps a semester of remedial classwork or online classes (e.g., [www.studyatapu.com/wildlife](http://www.studyatapu.com/wildlife)) would fill the void and get students to a common academic level. It is not feasible to take students from different academic backgrounds and educate them as a cohort and expect excellence in all students. Because the pool of applicants is large (nearly 500), we believe implementing this recommendation should be straightforward.

It is important to note that it is common practice for students in the U. S. to take remedial coursework on their own initiative to compete for admission to highly competitive academic programs.

**Challenge 2.** The available faculty does not have the breadth of skills or time to teach some of the basic classes in vertebrate, community, and evolutionary ecology.

**Recommendation:** These classes are part of the foundational classes mentioned above. There are several actions that can be taken to address this shortfall. First, recruit faculty more widely from India and elsewhere to teach the core classes. Many topics in these areas of ecology are field-based classes so classroom teaching could be combined with field labs. There are also online classes that could be incorporated into the program for an overview of these topics. Classes specifically related to the communities and ecosystems of India should be developed. Implementing this recommendation would entail additional program costs but with the advent of distance learning, for example, we believe these goals are achievable.

**Challenge 3.** The breadth and depth of course content is the subject of intense debate among faculty and students.



**Recommendation:** Curriculum content for a graduate degree in any discipline is an ongoing debate in universities worldwide and animated discussion amongst faculty and students is indicative of academically healthy programs. Like other scientific disciplines, the most relevant topics for course work in wildlife ecology and conservation biology are dynamic and evolving. Because wildlife conservation and management are based on science, there should be a mix of classes that address biology, habitats, and human dimensions, and the tools necessary to understand their interactions should be fundamental to curriculum development. Foundational skills in biology and quantitative methods represent the absolute minimum in classwork. Because conservation science is broad, ranging from law enforcement to statistical modeling, to human dimensions, there is no single prescription to be a successful wildlife or conservation biologist.

One obvious contrast between the WCS/NCBS academic model and that in U.S. universities, for example, is that in U.S. universities a student's curriculum is highly individualized. In concert with their mentor and academic committee, each student develops an academic plan that addresses their deficiencies and professional goals. When an individualized program is not possible and when the training period is short, as in the current program, there is greater need for a common knowledge foundation prior to admission. As discussed above, this can be achieved by students addressing their deficiencies prior to applying to the program.

To better guarantee the success of the program, the faculty should establish a firm objective of ensuring that students, at the end of the first year of study, have mastered the key concepts underlying ecology and conservation biology, including the basic skills needed to visualize and analyze data.

**Challenge 4.** Limited, temporary, and guest faculties whose engagements with the program are largely voluntary are not a stable resource for program permanence.

**Recommendation:** In our opinion this is a serious problem because a program cannot be stable without a predictable faculty and physical infrastructure. It appears that a home base (NCBS) is in place, but there is need to obtain a core set of permanent faculty, covering a breadth of disciplines, to assure program consistency. Training skilled conservation scientists is essential everywhere but perhaps especially in India where the human population has infringed upon the majority of habitats. Trying to develop the program on an 'as-available' faculty basis is not sustainable and puts the long-term integrity of the program at risk. We encourage current faculty and NCBS administrators to develop a strategy to employ a permanent set of core faculty with designated time commitments to the program.

**Challenge 5.** There is concern that engagement of faculty from the NCBS in the M.Sc. program is insufficient to meet program goals.

**Recommendation.** The WCS/NCBS program in wildlife biology and conservation has the potential to be one of the leading programs in the world. This potential will be enhanced if the program is more formally incorporated into NCBS with permanent faculty. The rich diverse of wildlife in India are poorly known to science, and when this rich biological diversity is coupled with the challenges of population growth and diverse cultural values, conservation research in India has the potential to be a model for the world. A clear vision of leadership in conservation science, with all its many dimensions, would be an appropriate goal for this program. To



fulfill this vision would take commitment but would raise the stature of graduates, faculty, and science produced. There are numerous areas of expertise relevant to conservation science that could more fully incorporate NCBS faculty—for example, mathematical modeling of biological systems, genetic variation and adaptability under climate change, non-invasive sampling to access population status, physiological limits to population growth, population dynamics in stochastic environments and wildlife disease and transmission potential to humans. When wildlife biologists interact with other related disciplines the conservation results are more likely to extend the margins of current understanding and provide novel insights to the solution of conservation problems. The opportunity for synergistic interactions amongst M.Sc. faculty and students and NCBS faculty has not been fully realized.

**Challenge 6.** Collaborations with academicians, conservation practitioners and wildlife institutions outside India are limited.

**Recommendation:** This issue can be readily addressed. One of the most common ways of extending the network of engaged individuals and institutions is through partnerships and memorandums of understanding (MOU). For example, the University of Montana has a MOU with universities in Bhutan for training in wildlife biology. As such we train students in the U.S. and teach at universities in Bhutan. Nine different faculty members have been to Bhutan and the University of Montana has educated 6 Bhutanese graduate students. When faculty members visit Bhutan they have offered short courses, assisted with research, and supervised graduate students. When U.S. faculties are in Bhutan their in-country costs are covered by the host university. When Bhutanese students are in the U. S., the University of Montana has paid their out-of-state tuition and provided funds for housing.

**Challenge 7.** Long-term opportunities for sustainable conservation do not exist in India's institutions.

**Recommendation:** Unfortunately, this topic is beyond our ability to fully address given our focus on the evaluation of the WCS/NCBS program. We do, however, think that with conservation and wildlife program housed in NCBS with permanent faculty, that the M.Sc. program will significantly advance conservation objectives in India. It would be a natural outcome for a stable program with well-trained students and dedicated faculty to be the example for wildlife research in Asia. National leadership in science-based conservation, as exemplified by Dr. Ullas Karanth's tiger research program, is already in place. The challenge is to extend this engagement to additional emerging leaders and to maintain this leadership role over the long-term.

**Challenge 8.** The financial stability of the program needs to be addressed.

**Recommendation:** Finances are an issue in most organizations and academic institutions. The permanent engagement of faculty in the program would be accompanied by initial, up-front costs, but this initial investment would increase the likelihood of securing long-term funding. Permanent faculty would have the time and commitment to ensure that their programs were adequately funded by being more interested in, for example, grant writing and collaboration with other faculty, institutions, and foreign organizations and governments. A permanent program is essential for this approach to be successful. We recommend that the M.Sc. steering



committee work closely with NCBS to initiate the necessary steps towards establishing the program as a permanent part of NCBS.

**Challenge 9.** There is a lack of laboratory space.

**Recommendation:** This challenge is related to some of the others—being a “temporary program” that is borrowing resources from the host institution to fulfill its mission. This approach is not sustainable in the long run and if students are to make significant contributions to conservation in India and beyond, they will need access to predictable resources. We do not have direct knowledge of the availability of laboratory space at NCBS, but suspects that with collaboration with NCBS scientists the appropriate training and space would become available. It is just a matter of continued collaboration and a willingness to share resources that are needed. Because it is not known what projects will be conducted or what laboratory resources are needed in the future, it is difficult to make specific recommendations for laboratory space requirements for the M.Sc. program. We do, however, suggest that scientists in NCBR work with interested students in the program to successfully use laboratory equipment for mutual studies.

**Challenge 10.** There is limited capacity building.

**Recommendation:** As stated earlier, the committee believes the initial years of the program have been a solid beginning towards greater capacity building. Conditional on realizing several next steps discussed above (e.g., permanent faculty, space, resources), we are confident that the program will be on solid ground towards fulfilling its mission to Indian society and conservation science. It is beyond the scope of this report to explain how the program can grow in the national government and across Asia. Implementing realistic science-based conservation strategies with practical results, however, will go a long way to moving the program to one of national prominence.

**Challenge 11.** Future leaders of the M.Sc. Program in Wildlife Biology and Conservation are difficult to identify.

**Recommendation:** Identifying the individuals who will be future leaders is always a challenge. One source of guidance is provided by the special qualities of the current director. A common approach is to seek an individual with those same qualities and select the best applicant to ensure that program growth and development will continue under consistent leadership. We suggest careful selection of a successor and to have that individual work closely with the current director for some period of time. An overlapping period of leadership will assure a smooth transition. Another option would be to send the newly selected director for targeted leadership training such as can be found in programs offered by the U.S. Fish and Wildlife Service. There may be resources from U.S. institutions or NGOs to cover the costs of the training.

### **Other Related Recommendations**

During our evaluation we identified additional activities that would increase the quality of the program. First, we suggest that exit interviews be conducted with graduates of the program to get their suggestions for program improvement so it can be adjusted as needed to maintain high quality and relevance to contemporary conservation issues.



Second, we suggest a seminar series be developed to address contemporary issues in conservation in India and elsewhere. The series could draw on outside expertise or be developed as a colloquium centered on a specific topic area. Most U.S. universities have seminar series directed by a faculty member but the discussion of weekly topics and suggestions for speakers is initiated by the students.

Finally, consider the addition of graduate teaching assistants to demanding courses to encourage faculty engagement in course offerings and assist students when the faculty member is not available.

### **Summary of Recommendations**

1. The program needs a clear identity and mission statement so there is no ambiguity as to expectations of student performance and accomplishments and the student's abilities upon graduation.
2. Ensure that students entering the program have a common academic background that the curriculum can build on. Remedial education should occur prior to being admitted to the program.
3. To accommodate the differences in professional goals of students, allow them to select an area of specialization (e.g., field research, human dimensions, and statistical ecology) in their third semester. This could be easily accomplished if recommendation 2 is implemented.
4. Recruit funded post-doctoral positions (from India and elsewhere) to help with teaching and working one-on-one with the students.
5. Provide dedicated work and laboratory space for students and visiting faculty.
6. To sustain national leadership in wildlife conservation and management in India, a core permanent faculty is needed with designated time commitments to the program.
7. Active recruitment should begin soon for a replacement for the current director so that individual can spend time with the director to better understand program operations and goals.
8. Strive to recruit high quality students from all geographic areas of India (if your mission statement is related to the entire country).
9. Make counseling services available to assist students that need help to adjust to the academic life at the NCBS.
10. Work more closely with NCBS faculty working in areas that could compliment or extend ongoing wildlife research so as to maximize opportunities to engage these experts in the M.Sc. program.
11. Once a clear mission statement is defined, revisit the curriculum as need to ensure that it closely matches the educational goals of the program.
12. Initiate formal agreements with U.S. and other foreign universities to increase outside involvement in the program and develop faculty exchange programs with these institutions.
13. Use graduate teaching assistants to assist faculty with their teaching so the student's needs are better met without undue stress on faculty.
14. Develop a seminar series that addresses contemporary and emerging conservation issues in India, Asia, and the world.
15. Conduct exit interviews for all students that graduate from the program.



We believe that implementing these 15 recommendations will enhance the program to the point that it will contribute significantly to establishing a pool of competent wildlife professional, establish a foundation for reliable scientific research in wildlife ecology, and provide the information needed to inform national conservation policy. With the second largest human population on earth, India is at critical threshold where decisions made now will affect the long-term future of its outstanding wildlife resource. Sustaining viable wildlife populations in the face of an increasing human population is not achievable without active management and conservation. The WCS/NCBS MSc. course has demonstrated an ability to educate part of the work force needed to address these challenges. The committee believes the changes recommended herein would take the program to a new level and elevate Indian conservationists to world leaders. We are confident that NCBS has both the human and physical resources to make that a reality.



## **Annexure 2**

**Minutes of MSc Wild Life Program review meeting held on Wednesday 20 March 2012, 4.00 pm, in VCR room "Axon".**

**In attendance:**

1. Prof. VijayRaghavan, Secretary, DBT (over skype)\*
2. Prof. Satyajit Mayor, Director
3. Prof. Upinder Bhalla, Dean
4. Prof. M.K. Mathew
5. Prof. Apurva Sarin, Head, Academics
6. Prof. Ajith Kumar
7. Prof. Uma Ramakrishnan
8. Dr. Kripa Jalapathy

A Committee chaired by the Prof. Mayor was convened to discuss the suggestions and comments of the MSc wild life Advisory review board.

\*Prof. VijayRaghavan attended the meeting in his capacity as Director, NCBS, at the time of the review, and as a member of the faculty of NCBS.

The meeting ended at 6:30 PM

**Minutes of the meeting**

**1. Opening remarks**

Prof. Mayor initiated the discussion and informed that the comments of the review committee will be discussed in the context of the existing program and how procedures can be put in place to improve the MSc. Wildlife & Conservation Program at NCBS.

**2. History**

Prof. VijayRaghavan gave a short recap on the program and the initial discussions on intended aims and objectives of the program with Profs. Mathew, Sarin and Ajith Kumar. A review board constituted with the Dean and the director of NCBS, and external advisory members Prof. Paul Krausman (University of Montana) and with Prof. Barry Noon (Colorado State University) and Prof. Mewa Singh provided their suggestions and recommendations on the program that had gone through 3 batches of intake, in the meeting held in Nov 2012. In a way the guest faculty was the strength in the initial growth of the program, especially when there was no in house core strength. Prof. Mathew elaborated that Drs. K. Ullas Karanth, Ajith Kumar and Anindya Sinha had approached with the proposal to start wildlife program at NCBS with the assurance of funding for first three batches of the academic program (6 years). The advisory board review was an attempt to gauge where we are and possible prospects of improvements. According to Prof. Mathew, the comments of the review highlighted some aspects, namely the involvement of NCBS faculty, the capabilities of NCBS and to review if all committed aspects were implemented.

**3. Overview of the Advisory Review board comments**

Prof. VijayRaghavan summarized key points the advisory board had made, in the meeting of Nov 2012, which looked into the content of the program and the directions taken in the context of research elsewhere in the world. In this context the advisory committee had articulated that the program had been doing well in terms of its growth, although some gaps remain in the context of the grasp of the current situation.

Prof. Ajith Kumar summarized all the points of the advisory board in the form of a presentation, which was also reiterated in the summary that was circulated prior to this discussion. The summary document is attached to the minutes of the meeting

Prof. Ajith Kumar informed that the review was primarily based on written materials provided to them including an internal review of the course, one on one meeting with several faculty and senior alumni, group meetings with alumni and current students, meetings with senior



administrators of NCBS, CWS, WCS and the Steering Committee of the course, and several meetings with the Course Director.

There was some discussion on if the current mission "Train wildlife biologists to conduct wildlife research and conservation" serves the intended purpose of the course being offered. On the question of whether the program should be Wildlife research based or wildlife conservation based, Prof. VijayRaghavan articulated a balance may indeed be essential. He however felt it was worth considering if the focus should be conservation research wherein there could be more flexibility, or it would be based on conservatories. The latter would be a narrower training and there would be a lack of core expertise. It was agreed on that it is best to keep the mission broad especially since this is an evolving field which may change based on various factors such as the faculty interests.

In view of the admissions to the program, Prof. Ajith Kumar expressed that while the encourage maintaining the diversity, the lack of quantitative skills of the incoming students from diverse backgrounds, poses a challenge to them. The ensuing discussions focused on the ways to remedy this void, and among the suggestions was to have a more stringent criteria at the selection level. Prof. Sarin gave the analogous situation of the students from various backgrounds coming on the TIFR - PhD program who eventually pick up over a 2-3 year period. However in this situation given the time constraint (2 year Program) this may indeed pose a challenge. It was also agreed that in the 3rd semester of the program the students may be made to undertake extra quantitative classes. This requires additional effort on the part of the faculty, but, may indeed be doable.

#### **4. Suggestion of a proposal based training**

Prof. VijayRaghavan elaborated that in the view of most course contents being freely available to the students, there is a need to move on a problem based approach. In his opinion a format where a field researcher could come to NCBS and outline a research program, could be followed. This while being stimulating for both teacher and the students, would ensure that the students get to know the fundamentals through available resources yet be able to apply in terms of questioning and problem solving. On Prof. Sarin's query on who would be able to take the students through the various elements, it was agreed that we would have to get appropriate faculty to train the students by probably breaking the proposal into teachable modules. Prof. Mathew also felt that since in the first year the students cover the basics, it would be a good approach to train based on proposal from the 2<sup>nd</sup> year onwards. For a good core of faculty suggestion was to integrate with IISc, especially since they are in the process of recruiting faculty for their undergrad program.

#### **5. Term of the course**

There were some discussions on whether the term of the course should be kept to 2 years. Prof. Mayor's suggestions in this regard were to increase the term to 3 years, with the 3<sup>rd</sup> year focused on field work. However the intake of students would be every 2 years to ensure some overlap between the incoming and senior students. Prof. Mayor also articulated that there has been a general concern in the integration of the Wild Life program students with other faculty and streams. While efforts have ensured that the students come in along with the other incoming PhD students and attend the orientation along with, more integration will ensure for a more interdisciplinary approach. The course could thus be broken down to classroom based, possibly for first 1 and half to 2 years and the remaining to a research based curriculum. Although the students in the current curriculum do 6 months of project which ultimately stretches beyond this stipulated time period, it would be advisable to increase the duration of the program formally. In terms of the project the students can be encouraged to think of a research question in line with what the faculty is working on, rather than an altogether new project.

#### **6. Number of student intake every year**

Most agreed on keeping the number of intake every year to 15 students, but it was decided to have 2 more seats open to international students. However, the need for more geographic representation of students was addressed in the meeting.

#### **7. Guest Faculty**



The advisory review committee was of the opinion that the dependence on guest faculty was not sustainable long term and thus permanent set of core faculty with designated time commitments to the program was the need. Among the various strategies discussed in the meeting to remedy this, it was agreed to have a long term MoU for 4-5 years with the agreement that the faculty will teach at NCBS for a month every year. Prof. Mayor suggested that we could also include IISc in these engagements. Currently approximately 70% of the teaching faculty is from NCBS/CWS but this could also be increased by engagement of modules with other NCBS faculty. The students can also go to other locations during the period of the program and take a few courses. Some suggestions of places were made in this regard which included field stations at NCBS. The review committee has expressed that, the M.Sc. program housed in NCBS offers an advantage to students and faculty in terms of the resources available and to seek out fruitful collaborations. The review committee pointed that NCBS has numerous areas of expertise relevant to conservation science and thus the program could more fully incorporate NCBS faculty, which according to them is not fully realized. Areas like mathematical modeling of biological systems, genetic variation and adaptability under climate change, non-invasive sampling to access population status, physiological limits to population growth, population dynamics in stochastic environments and wildlife disease and transmission potential to humans, would greatly impact with such an interaction.

#### **8. Space for class and lab work**

While there was a concern regarding the lack of space to conduct lab work, a consensus was reached that this indeed could easily be remedied by using the teaching lab, implementing procedures and providing storage space for samples. There was also a discussion on the apparent isolation of the wildlife students from the rest of the campus activities. Dr. Bhalla noted that the nearly exclusive use of Himsagar (LH3) by the wildlife students was a contributing factor to this. Dr. Ajith Kumar said that the students need study space. Dr. Bhalla pointed out that there was considerable common space around campus for students, and the occupation of LH3 was counterproductive in terms of their interactions with the rest of the campus community, as well as being an obstacle to other courses that need to use the room. He suggested that just like all other students, the wildlife students should expect to move around to different lecture rooms for different courses.

#### **9. Funding for the program**

While currently NCBS is funding the program, there was a suggestion to ensure that more independent funding be raised from sources, such as UGC, DST. The review committee also recommended that the M.Sc. steering committee work closely with NCBS to initiate the necessary steps towards establishing the program as a permanent part of NCBS.

#### **10. Need for a program coordinator**

The issue of searching for a program coordinator was also discussed in the meeting. Since the responsibilities would primarily involve the administration of the course, there will be no research component. Prof. Ajith Kumar and Dr. Ramkrishnan agreed to prepare the draft of an advertisement.



### **Annexure 3**

An allocation of Rs.245 lacs have been made for the Wildlife Programme in the 12<sup>th</sup> Plan, with annual allocation of Rs.49 lacs. The proposed budget for this given below.

#### **M.Sc Wildlife Biology & Conservation: Budget for 2013-14**

<b>Budget Head</b>	<b>Description</b>	<b>Rs.</b>
Fellowships & Faculty honoraria	Student fellowships @ Rs.10,000 p.m. X 16 students	1,920,000
	Post-Doc Fellow @Rs.40,000 p.m.	480,000
	Student projects @ Rs. 200,000 per project	
	Faculty honorarium (Sem III: 7 papers@Rs.70,000)	490,000
	Faculty honorarium - Sem II: pending	250,000
	Faculty honorarium - Sem I: pending	200,000
Equipment	Minor equipment for dissertation projects	200,000
Consumable	Stationeries	84,000
	Laboratory & field consumables: Optional courses	150,000
Communication	Telephone & postage	48,000
Travel	Faculty travel	200,000
	Field practical Travel: 30 days/semester	200,000
	Committee meetings: Academic, Steering and Interview committees	50,000
Others	Library - books and journals	100,000
	<b>Total</b>	<b>4,372,000</b>



**Annexure 4: Publications from dissertations**  
**2012-13**